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STRESS AND DEPRESSION DETECTION USING SENTIMENT ANALYSIS

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Abstract: Stress and depression are two of the most well-known and debilitating mental illnesses that have a significant impact on society. Using social networking to improve depression and stress detection systems, automatic health monitoring systems could be crucial. Sentiment Analysis refers to the use of natural language processing and content mining techniques to identify feelings and opinions. Full with emotion Computing is the study and development of systems and devices that can recognise, decode, analyse, and simulate human behaviour. Sentiment analysis and deep learning techniques could provide strong algorithms and frameworks for assessing and monitoring ment.

Keywords: *Stress and depression, Ehealth, Sentiment analysis, Social media, Deep learning*

I INTRODUCTION

All of them Social media is, without a doubt, the most abundant source of human-generated text input. Internet users' comments, suggestions, and criticisms represent their attitudes and feelings about various topics. This study describes a knowledge-based system that includes an emotional health monitoring system to identify users who may be suffering from psychological diseases such as depression or stress. Symptoms of various mental illnesses are typically detected passively. In this case, the authors believe that online social behaviour extraction provides a way to actively uncover psychological disorders early on. Because of the psychological elements taken into account in the diagnosis, it is difficult to pinpoint the disorder.

Effective health monitoring systems and diagnostic assistance could be critical in improving health professionals' job and lowering healthcare expenses. Sentiment and deep learning technologies could aid in achieving these goals by providing objective assessment tools and methods. These tools and methods aren't meant to take the role of a psychologist or psychiatrist, but they can help them make better judgments.

Our method, which is new and creative for the identification of psychological disorders, does not rely on self-disclosure of psychological elements via questionnaires. Instead, provide a machine learning methodology for detecting psychological disorders in social networks that uses features taken from social network data to precisely identify likely illness detection scenarios. We examine the characteristics and use machine learning to analyse properties of the two categories of psychiatric diseases using large-scale data sets.

II METHODOLOGY

2.1 System Overview.

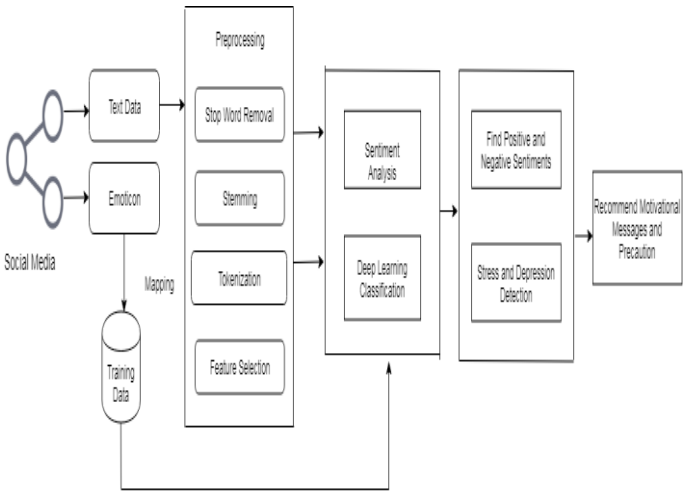

Fig. System Architecture

Using the sentiment analysis and deep learning framework, we structure the issue as a classification problem to detect four categories of psychiatric diseases in social networks in the suggested systemic approach:

i. Stress
ii. Depression
iii. Positive comments
iv. \Negative comments

An unique system for tracking and detecting probable emotional illnesses in users based on the classification of words with sad or stressed content..

2.2 Mathematical Model

The mathematical model for Stress and Depression Monitoring System is as-

S= {I, F, O}

Where,

I = Set of inputs

The input consists of set of Words/Emoticon/Microblog. It uses Twitter and Facebook dataset.

F = Set of functions

F= {F1, F2, F3….FN}

F1: Data Collection

$$\text{Dataset} =< T, F >$$

Where,

T- Twitter

F-Facebook

F2: Sentimeter

Sentimeter-Br2 is a word-dictionary with its respective sentiment intensity (positive or negative words), considering n-grams, verbal tenses and adverbs. The sentiment intensity value of an S-sentence, using the Sentimeter-Br2

$$Sentimeter_{br2(s)} = \frac{su + sb + st}{k + p + q + r}$$

Where, SU represents the sentiment score of an unigram,ST represents the sentiment score of a trigram,SB is the sentiment score of a bigram,k is related to the sentence tense, k = 1, if the sentence has a verb in the past participle; and k = 0 if the sentence is in another tense or the sentence does not have a verb, p is the total number of unigrams in the F-sentence, with the exception of words with no sentimental intensity value (stopwords),q is the total number of bigrams, r is the total number of trigram.

F3: Enhanced Sentiment Metric

$$eSM(S) = Sentimeter_{Br2(S)} * C * \exp\left(a_1 * A_1 \ldots \ldots + a_n * A_n + g_1 * M + g_2 * F + e_1 * G + e_2 * nG\right)$$

Where, C represents a scale constant; a1...an represents binary factors related to age ranges, if one of them is equal to one, the others are zeros; A1...An are the weight factors of each age range, considering four ranges; g1 and g2 are binary factors related to the gender; M and F are the weight factors of gender, man or woman, respectively; e1 e e2 represents binary factors related to educational level (higher education or not); G and nG are the weight factors of educational level, higher education or not, respectively.

F3: Sentiment Analysis

$$Data =< w, N >$$

Where,

W – Words

N – Naïve Bayes

F4: Classification

$$Data =< w, rnn >$$

Where,

W – Words

rnn – Recurrent Neural Network

O=Find Disorder (i.e. Positive comments, Negative comments, Stressed user, Depressed user)

III CONCLUSION

Automatically identifying potential Internet users with sadness and stress is a hazard to people's health in this proposed approach. As a result, users who are depressed can be discovered and assisted before taking any severe actions that may have long-term consequences. We investigate the relationship between users' states of psychological disturbance and their social contact behaviour using data from real-world social networks. We advise users to take health measures and send them through mail for user interaction.

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